What Are You Going to Throw

By Cdr. Dave Culbertson

I always thought day-VFR, functional check flights (FCFs) on FA-18s coming out of overhaul, repair, and modification at Naval Air Depot (NADEP) North Island would be routine and non-challenging. My experience over the last 18 months at the NADEP has proven otherwise. It's exciting and challenging because no two flights are the same. We observe and experience a multitude of aircraft systems malfunctions an operational squadron hopes never to see. It's rewarding because we are the "final check" to make sure the fleet receives a quality aircraft that stands ready to implement our national policy.

The mental preparation for a NADEP FCF is the same as in the fleet. Each FCF flight can be like a NATOPS-simulator check ride. Constant vigilance for multiple aircraft malfunctions is a must. It's a "What are you going to throw at me today?" attitude toward flight.

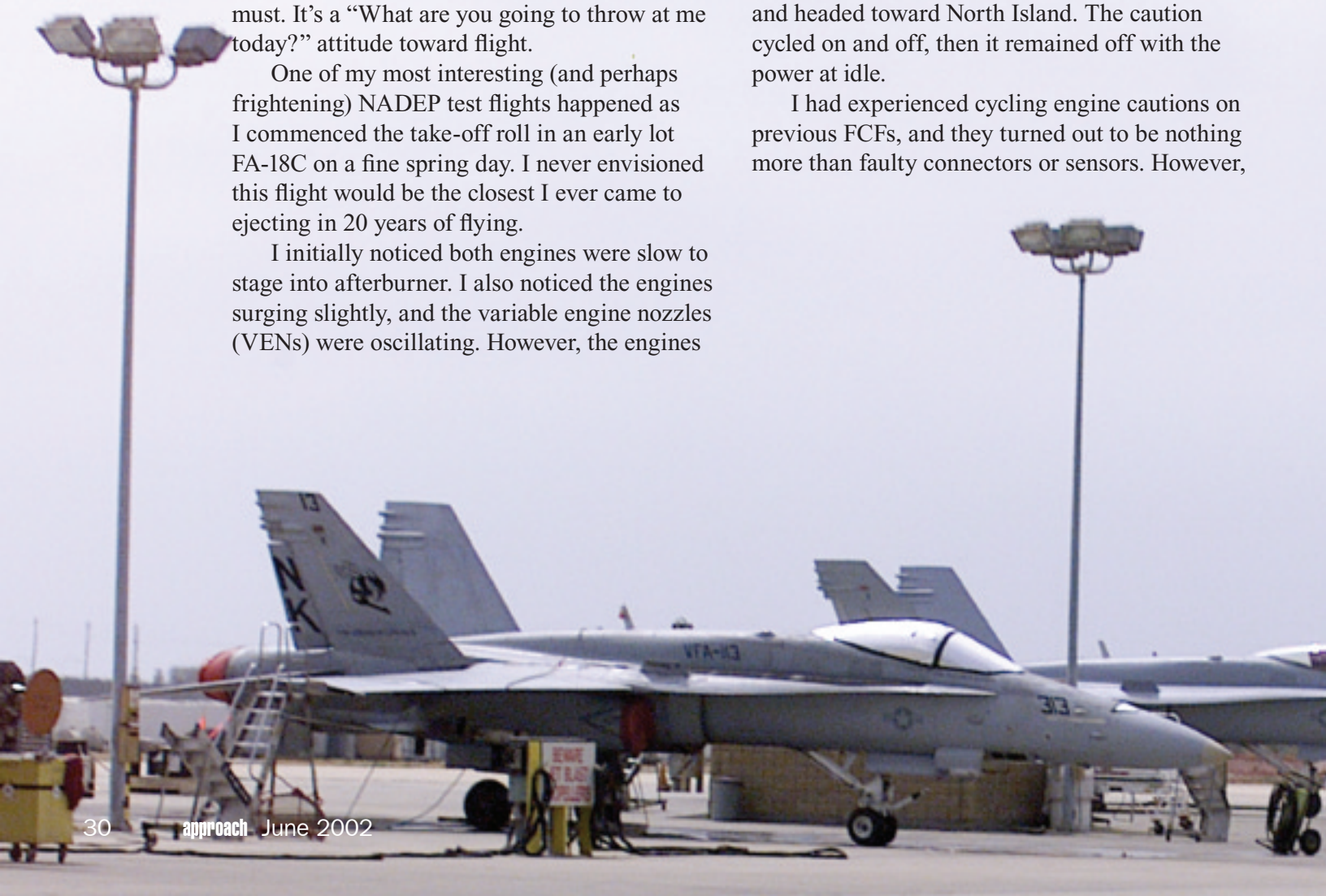
One of my most interesting (and perhaps frightening) NADEP test flights happened as I commenced the take-off roll in an early lot FA-18C on a fine spring day. I never envisioned this flight would be the closest I ever came to ejecting in 20 years of flying.

I initially noticed both engines were slow to stage into afterburner. I also noticed the engines surging slightly, and the variable engine nozzles (VENs) were oscillating. However, the engines appeared to be smooth and normal after deselecting the afterburners and continuing the takeoff roll. Therefore, I decided to transit out to the SOCAL W-291 to complete the FCF but kept a special eye on the engines.

While transiting toward the warning area, I selected afterburners several times, individually and together, for short and longer durations. There weren't any problems, so I continued with the flight profile. After completing the flight-control roll checks and 10,000-foot, engine-transient checks, I climbed for the high work.

During the climb profile, at 20,000 feet, an "Engine Left" caution cycled on and off. I retarded the left throttle to idle, reviewed engine parameters on the digital-display indicator (DDI) and the integrated-fuel-engine indicator (IFEI), and headed toward North Island. The caution cycled on and off, then it remained off with the power at idle.

I had experienced cycling engine cautions on previous FCFs, and they turned out to be nothing more than faulty connectors or sensors. However,



at Me Today?

this caution, coupled with the engine anomaly on takeoff, supported my belief that this truly might be an issue. In any case, I always treat each caution and indication like it is the Real McCoy.

At 60 miles from North Island, on the return-to-base profile, I began assessing the condition of the left engine. Initially, the engine parameters appeared to match at idle power, but after a few minutes, the "Engine Left" caution reappeared. The left engine was surging, the VENs were fluctuating, and the EGT was rising and bouncing around. Then, all of a sudden, the left-engine nozzle opened to 106 percent, with associated "L EGT HI" and "Engine Left" cautions. As I assessed the other engine parameters, I noticed the DDI-engine page and IFEI showed the EGT to be oscillating around 1,300 degrees Celsius. I secured the left engine and declared an emergency. Interestingly, the temperature indication never dropped, even with the engine shut down. I could not conceive of the engine surviving such a high temperature. Either a sensor was defective, the engine was going to melt, or a combination of both would happen, so I stayed alert for any fire indications.

As I started catching my breath and feeling confident the aircraft was going to make it—40 miles from home—the right engine began to surge from VEN oscillations. The right EGT indicated oscillations from 700 to 950 degrees Celsius. The right VEN was fluctuating plus-or-minus 15 percent, with associated "Engine Right" and "L EGT HI DDI" cautions cycling on and off. I needed just 10 more minutes of thrust from the right engine; it was my only hope for a dry landing.

I looked down at the cold Pacific waters and all the fishing vessels, thinking if I did have to do a silk-water landing, I at least would have a chance for a comfortable ride home. After preparing the cockpit for ejection, I said a few prayers. I felt like I had no choice but to stay with the aircraft until the right engine quit or a fire

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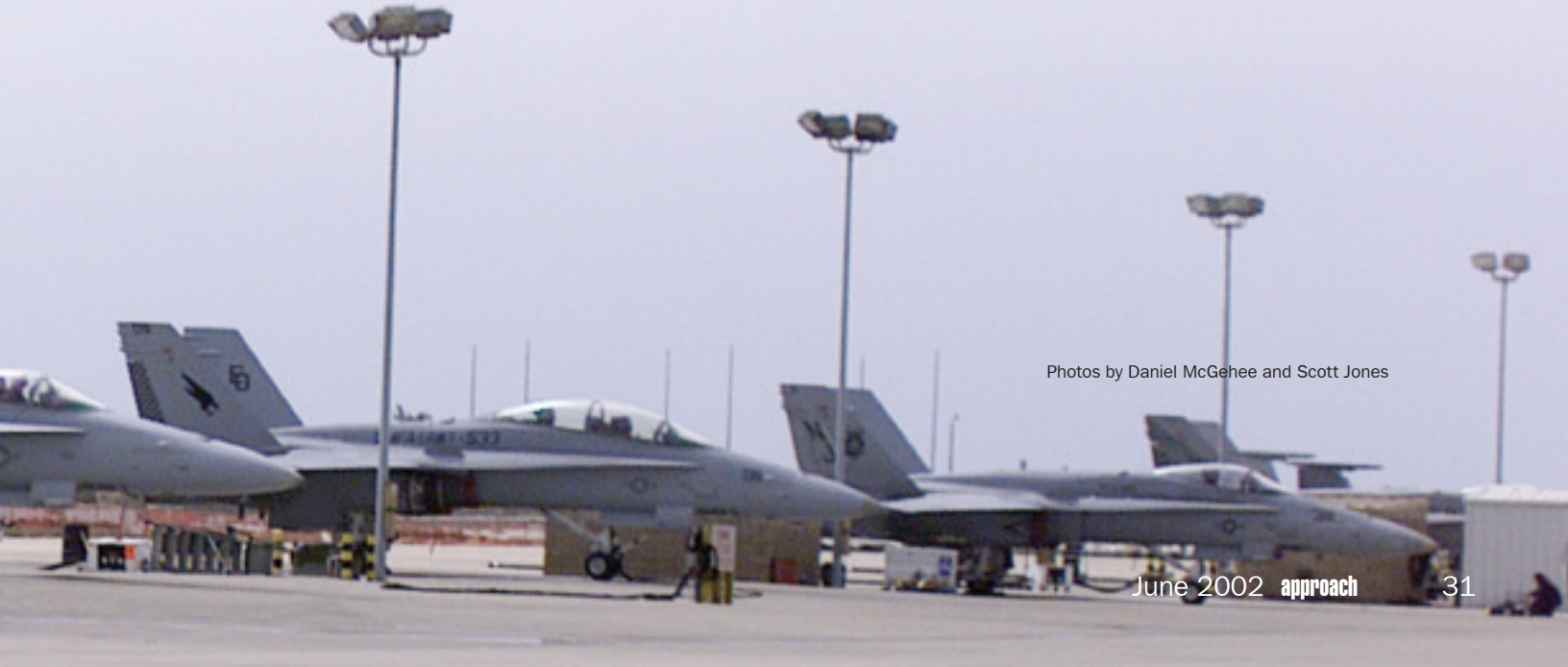

Photos by Daniel McGehee and Scott Jones